

February, and October in Central Africa, according to our dated specimens. *T. regina* does, however, occur in the dry season.

26. *Papilio demoleus*.

Papilio demoleus, Linnæus, Mus. Lud. Ulr. p. 214 (1764).

♂, Henga, W. of Lake Nyasa, Jan. 26th, 1895.

"Large yellow and black velvet Swallow-tail" (*R. C.*).

27. *Papilio leonidas*.

Papilio leonidas, Fabricius, Ent. Syst. iii. 1, p. 35 (1793).

♀, Foot of Jakwa Mountain, Henga to Nkamanga, Jan. 23rd, 1895.

"Turquoise and Black" (*R. C.*).

28. *Papilio pseudonireus*.

Papilio pseudonireus, Felder, Reise der Nov. Lep. i. p. 94 (1865).

2 ♂, Kantorongondo Mountain, 5900 and 6975 feet, Nyika, April 15th and 16th; ♀, Cheni-Cheni Mountain, 6100 feet, Nyika, April 17th, 1895.

"Blue and black Swallow-tail" (*R. C.*).

X.—On a new Generic Distinction between the Scorpions of the Genera *Scorpio* and *Palamnæus*. By R. I. POCKOCK.

IN the Ann. & Mag. Nat. Hist. for 1876, vol. xvii. pp. 12–13, Dr. Thorell split the large black scorpions of tropical Africa and Asia into two sections, proposing for the African and Indian species the term *Pandinus*, characterized by the thinness of the inner border of the hand, and for some species inhabiting Indo-Malaya, characterized by the thicker and more rounded appearance of this border, the term *Palamnæus*. Since, however, *africanus* of Linnæus is the type of *Pandinus* and also the type of *Scorpio*, most of Thorell's successors have, on the grounds of priority, adopted the latter title in preference to the former; while *Palamnæus*, of which the type is *Petersii*, Thor. (probably identical with *spinifer*, Hempr. & Ehrb., and possibly with *longimanus*, Herbst), has been allowed to remain as symbolizing a more or less accurately definable form. The character, however, upon which *Palamnæus* was based cannot be said to be of very

great value; and since Prof. Kraepelin has recently shown that the species referred to *Palamnaeus* are in reality more nearly allied to the Indian species of *Scorpio* than the latter are to the African species of this genus, it is probable that all arachnologists will be content to abide by his decision that the thickness of the inner edge of the hand in *longimanus* and its allies is not of sufficient value to be accorded generic rank. Prof. Kraepelin, in fact, regards all the species referred by Thorell and others to *Scorpio* or *Pandinus* and *Palamnaeus* to the genus *Scorpio*, which therefore extends over tropical Africa, India, Ceylon, Burma, Siam, Sumatra, Java, and Borneo; but at the same time he points out that the species involved fall into two divisions, based upon a structural feature which, as is so often the case, coincides with the division that would be drawn upon geographical grounds. The African forms, for example, are recognizable from the Asiatic* by the presence on the posterior side of the lower surface of the brachium of the chela of a ridge, in front of which run two or more rows of piliferous pores, this ridge and the definite rows of pores being hardly perceptible in the Asiatic species. This character Prof. Kraepelin does not look upon as of generic importance.

Whilst engaged, however, in investigating the remarkable stridulating-organs presented by the scorpions of this section †, I discovered that these organs furnish a valuable additional distinctive character between the Ethiopian and Oriental species. In each case the instrument consists of a cluster of spiniform notes and of an adjacent area of granules, which, by being rubbed against the tips of the notes, throw them into a state of vibration; and in both cases the organ is situated between the basal segment of the chela and the corresponding segment of the first walking-leg. But, as the late Prof. Wood-Mason pointed out ‡, the cluster of notes in the Indian species is situated on the coxa of the chela and the granular area on the coxa of the first leg. I find in the African species, on the contrary, that the notes are placed upon the maxillary process of the first leg and the cluster of granules upon the coxa of the pincer. These organs, it seems, may well be regarded as of generic importance; and in this case the term *Scorpio* must, of course, be retained for the African

* With the exception of the so-called Sumatran species *pallidus*, which has the characters of the African forms. But if my suggestion respecting the locality of this species prove correct, this apparent exception will fall to the ground (*vide* Ann. & Mag. Nat. Hist. (6) xvii. p. 435, in note).

† For descriptions and figures of these organs see 'Natural Science,' July 1896.

‡ Proc. Ent. Soc. Lond. 1877, pp. xviii, xix.

species, while to all the Asiatic forms that present the instrument discovered by Wood-Mason, Thorell's name *Palamnæus* may be applied, though the definition of the genus will have to be entirely altered and the original character upon which it was based wholly ignored.

The two genera may be characterized in the following terms:—

- A. The key-board of the stridulator placed upon the maxillary process of the coxa of the first pair of legs, the rasp or granular area in a slight depression on the adjacent surface of the coxa of the chela; the lower surface of the brachium with rows of piliferous pores and defined posteriorly by a ridge *Scorpio* (type *africanus*, L.).—*Distr.* Tropical Africa, S. Arabia.
- B. The key-board of the stridulator placed upon the coxa of the chela and the rasp upon the adjacent area of the coxa of the first pair of legs; the lower surface of the brachium without regularly arranged piliferous pores and posteriorly more convexly rounded *Palamnæus* (type *Petersii*, Th.).—*Distr.* Oriental Region (Bombay to Borneo).

I have noticed the position of the stridulator in the following species of *Scorpio*:—*africanus*, Linn.; *dictator*, Poc.; *cavimanus*, Poc.; *bellicosus*, L. Koch; *viatoris*, Poc.; *exitialis*, Poc.; and *Gregorii*, Poc.: and I think there can be no reasons for doubting that it will prove to be present in *Sc. africanus subtypicus*, Kraep.; *arabicus*, Kraep.; *pallidus*, Kraep.; and *meidensis*, Karsch; of which the last-named, I doubt not, belongs to the *exitialis*-like forms of the genus, and not to *Opisthophthalmus*, as Kraepelin has suggested.

As for Wood-Mason's organ, it occurs in specimens that I refer to the following species of *Palamnæus*:—*scaber* (Thor.); *Swammerdami* (Sim.); *fulvipes* (Koch); *megacephalus* (Koch); *cæsar* (Koch); *bengalensis* (Koch); *Phipsoni* (Poc.); *latimanus* (Poc.); *gravimanus* (Poc.); *indicus* (Linn.); *spinifer* (Hempr. & Ehrb.); *Thorellii*, Poc.; *liophysa*, Thor.; and *borneensis*, Thor.

It is also worth bearing in mind that the presence of these organs will serve as an additional character for separating *Scorpio* and *Palamnæus* from *Opisthophthalmus* and *Heterometrus*.